REMARKS

Applicants appreciate the continued thorough examination of the present application that is reflected in the final Official Action of January 29, 2004. Applicants have filed the present Request for Continued Examination (RCE) and the present Amendment to provide the Examiner a fresh opportunity to examine the independent claims, which have been amended extensively by incorporating therein recitations of the dependent claims, and to examine new independent and dependent claims, which have also combined recitations of many of the dependent claims, as will be described in detail below. The present Amendment also is being filed to clarify the distinction between Process Hazard Analysis (PHA) and Mechanical Integrity (MI). Applicants respectfully request the Examiner to take a fresh look at the claims in light of the above amendments, and the remarks which follow.

Claims 1, 4, 7, 10, 11 and 17-22 Are Not Anticipated by Herrington

The "Response to Arguments" section of the Official Action of January 29, 2004 alleged three basic grounds for anticipation of these claims. In particular, the Official Action asserted that the claim elements related to "selecting" can be interpreted so broadly as to cover a trivial "non-selection". Second, the Official Action stated that Process Hazard Analysis (PHA) is equivalent to Mechanical Integrity (MI) as described in the cited reference Herrington. Finally, the Official Action stated that the database used in Herrington anticipates the method claims being performed in a data processing system. Applicants respectfully submit that none of these grounds for anticipation are appropriate, as will now be described.

(a) The Amended Claims Reinforce that Nontrivial Selecting is Being Performed

At Paragraph 9 of the "Response to Arguments", the Examiner states that the claim elements of "selecting" can be interpreted so broadly as to read on selecting a study type or no study type, or selecting a process or no process. In order to eliminate any possibility of such an interpretation, independent Claim 1 has been amended to incorporate therein the recitations of dependent Claims 69 and 72. These amendments are not narrowing amendments, because they merely clarify that nontrivial selecting steps are

performed from among a plurality of nontrivial choices. As such, the full range of equivalents is available for these amendments. Amended Claim 1, therefore, recites as follows:

> 1. (Currently Amended) A method of conducting a process hazard analysis (PHA), comprising the following steps that are performed in a data processing system:
> storing information describing a plurality of chemical processes in the data processing system;
> storing information describing a plurality of study types in the data processing system;
> selecting one of the plurality of chemical processes to be evaluated;
> selecting one of the plurality of study types to be performed on the one of the plurality of chemical processes;
> conducting the selected study type on the selected chemical process in the data processing system, wherein the chemical process is evaluated on the data processing system for the presence of a hazard scenario; and then
> generating a resolution plan to the hazard scenario in the data processing system. (Emphasis added.)

Applicants respectfully submit, and the Examiner apparently agrees, that Herrington does not describe or suggest the two storing steps or the two selecting steps of Claim 1 as amended. It also would not be obvious to provide these steps, because Herrington relates to a single mechanical integrity program that is being created. Claim 1 is, therefore, neither anticipated by Herrington nor obvious in view of Herrington for at least these reasons.

(b) "Mechanical Integrity" is Not "Process Hazard Analysis"

Moreover, in Paragraph 10 of the "Response to Arguments", the Examiner appears to equate Process Hazard Analysis (PHA) of Claim 1 and Mechanical Integrity (MI) as described in Herrington. Applicants agree that PHA and MI are two elements of the OSHA Process Safety Management (PSM) regulation (29 CFR 1910.119(e) and (j), respectively). PHA and MI are, therefore, related, but they are distinct and separate efforts to ensure a safe chemical process. In particular, PHAs relate to hazard scenarios, and MIs do not. These differences are highlighted in Claim 1, in the present specification and in the Herrington article.

Specifically, Claim 1 recites:

> conducting the selected study type on the selected chemical process in the data processing system, wherein the chemical process is evaluated on the data processing system for the presence of a hazard scenario; and then
>
> generating a resolution plan to the hazard scenario in the data processing system. (Emphasis added.)

As described in the present application, for example at Page 2, lines 15-20, a PHA is primarily a hazard scenario identification tool, regardless of the specific analysis technique used. Standard references, such as CCPS's "Guidelines for Process Hazard Analysis, 2nd Edition" list multiple studies that are used in differing circumstances to analyze hazards, which include checklist, what-if, HAZOP, FMEA, fault tree, and event tree studies. As such, a PHA generally serves as the identification tool, by which a listing of items to be addressed by appropriate subject-matter experts is generated and managed.

The hazards uncovered in a PHA may fall into a number of categories, as noted in the present application, for example at Page 4, lines 3-6:

1. Improper human intervention or action;
2. Lack of knowledge on the part of operations personnel;
3. Intentional harm (sabotage);
4. Failure of equipment or other process components, either due to wear and tear, or due to some external cause (i.e., fire); and/or
5. External or environmental factors (wind, earthquake, etc.).

Each category of hazard may be dealt with in its own appropriate manner. For example, improper human intervention may be overcome by improved operating instructions and standard procedures, which can define appropriate action, and the consequences of (and fixes for) inappropriate actions. Similarly, lack of knowledge may be overcome by training.

Therefore, the results of a PHA include lists of hazard scenarios identified for various nodes of a chemical process. The scenarios may have an associated risk ranking so that they can be ranked against each other and against hazard scenarios established for other processes. If applicable, a recommendation may be made to consider additional controls so that the risk ranking can be lowered.

In sharp contrast, an MI effort is dedicated to prevention of unplanned equipment failure through defined maintenance efforts, particularly when such a failure results in a

catastrophic release of chemicals. An MI program may draw on certain hazard scenarios identified in a PHA to help define which equipment elements should be included. However, as can be seen from the list above, many hazards uncovered in the PHA can and are addressed completely separate from the MI effort.

Similarly, many items included in a company's MI program are not identified through the PHA process, as noted, for example, in Herrington Page 111, col. 1, lines 11-19 and Page 111 col. 2 lines 6-8. Other methods for MI scope definition include:

1. Failure/reliability history of particular pieces of equipment or classes of equipment, as noted in Herrington, Page 111, col. 2, lines 3-4;
2. Legal/regulatory requirements independent of the PSM regulation, such as boiler and pressure vessel laws, as noted in Herrington, Page 110, col. 2, lines 19-21, Page 111 and col. 1, lines 19-22, col. 1, line 36 to col. 2, line 1;
3. Economic considerations (business critical) independent of any safety issues, as noted in Herrington, Page 111 Figure 2; and/or
4. National consensus standards and generally accepted good engineering practices, as noted in Herrington Page 110, col. 1, lines 23-26, Page 111, col. 2 lines 11-16.

Accordingly, even though Herrington describes *"A Team-Based Approach To Mechanical Integrity Implementation"*, as noted in the Herrington title, this team-based approach would not describe or suggest the above-quoted recitations of Claim 1:

> conducting the selected study type on the selected chemical process in the data processing system, wherein the chemical process is evaluated on the data processing system for the presence of a hazard scenario; and then
>
> generating a resolution plan to the hazard scenario in the data processing system. (Emphasis added.)

In Paragraph 12 of the "Response to Arguments" section, the Official Action states:

> It is re-iterated Herrington discloses a method for using the Tennessee Eastman Division Process Hazard Analysis (TEDPHA) for studying the Mechanical Integrity program in compliance with OSHA's PSM regulation (1910.119)....

Applicants respectfully submit that this statement does not accurately characterize Herrington. Rather, Herrington discloses a method for using the Tennessee Eastman Division Process Hazard Analysis (TEDPHA) team of people to provide guidance regarding the contents of the Mechanical Integrity program in compliance with OSHA's PSM regulation. See the paragraph bridging Pages 111 and 112 of Herrington:

> After trying a number of approaches to actually doing the classification of individual items, it was decided that members of the Process Hazard Analysis (PHA) team would be best qualified to make this call. So, for all processes for which the PHA had been completed, knowledgeable experts from the PHA team were given training on the MI classification process, and they used this training, the PHA results, and their judgment to make the classifications. In cases where the PHA had not yet been performed, operations personnel developed "preliminary critical lists" which are then reviewed and revised later, once the PHA is completed. (Emphasis added.)

Thus, this passage simply states that: (a) for processes where a PHA had been completed, and (b) where the team members had knowledge of the potential hazards that might be caused by a mechanical failure, it is very efficient to allow these people to help classify equipment as routine or critical in the MI program. It does not suggest that hazards uncovered in the PHA are applicable to the MI effort.

To summarize, PHAs and MIs are both governed by the OSHA regulations. However, PHAs relate to hazard scenarios and MIs do not. Moreover, the entire thrust of Herrington is that, once a team has been assembled to do a conventional PHA, they may be given training on MI, and their knowledge may be used to classify equipment as routine or critical for MI purposes. Herrington does not describe or suggest a computer-based method for conducting a PHA, as recited in Claim 1. For at least these additional reasons, Claim 1 is patentable over Herrington.

(c) Herrington Does Not Describe or Suggest Performing a Process Hazard Analysis in a Data Processing System

Claim 1 is replete with references to the steps thereof being performed in a data processing system. Thus, the operations of the steps recited in Claim 1 are performed in a data processing system. However, in Paragraph 12 of the "Response to Arguments" section, the Official Action states:

> Further, the method of Herrington is performed in a data processing system such as a database (page 112, column 1, line 22 to column 2, line 6), as in instant claims 1-3.

Applicants respectfully submit, however, that the cited portion of Herrington does not describe or suggest any of the recited claim steps being performed in a data processing system. Rather, this cited portion of Herrington states:

> Even before MI inspections had begun there was a need to list the items of equipment to be inspected and to associate with each item certain inspection parameters such as type of inspection, frequency, applicable procedures and standards, location, and a number of other types of data. Once the inspections began, the data to be managed began to expand geometrically. The effort to develop a comprehensive database to contain and manage all of the MI data is still ongoing. Currently several unconnected databases are being used, and this imposes a significant burden on the data manager to enter and update data. An equipment-related database team is now at work within the division to bring about the merger and improvement of a number of formerly independent databases, and this effort will continue for some time after the fully implemented MI program is in place. (Emphasis added.)

Applicants respectfully submit that this paragraph merely says that a database is used to store results of inspection data, and that multiple databases may be used and linked. As is well known, a database is used to store and retrieve information therein, but a data processing system is used to process data. The mere existence of a database for MI data does not describe or suggest:

> 1. (Currently Amended) A method of conducting a process hazard analysis (PHA), comprising the following steps that are performed in a data processing system:...
>
> selecting one of the plurality of chemical processes to be evaluated;
>
> selecting one of the plurality of study types to be performed on the one of the plurality of chemical processes;
>
> conducting the selected study type on the selected chemical process in the data processing system, wherein the chemical process is evaluated on the data processing system for the presence of a hazard scenario; and then
>
> generating a resolution plan to the hazard scenario in the data processing system. (Emphasis added.)

For at least these additional reasons, Claim 1 is patentable over Herrington. Claims 2-4, 7, 10, 11 and 17-22 are patentable at least as depending from patentable Claim 1.

Moreover, many of these dependent claims are independently patentable. For example, Claim 10 recites:

> 10. The method of Claim 1, further comprising the step of customizing the study type prior to the conducting step.

Claim 10 was rejected as being anticipated by Page 110, col. 1, lines 27-29 of Herrington. However, this passage merely states:

> The division's MI program plan was designed and piloted in 1993-94, and implementation is now nearing completion.

This sentence does not describe or suggest a customized study type. Claim 11 is patentable at least as depending from Claim 10.

Finally, Claim 17 recites:

> 17. The method of Claim 1, wherein the resolution plan comprises a final action item and at least one interim action item to be completed prior to the completion of the final action item.

Assuming, for the sake of argument, that the OSHA regulations describe the use of action items, there is no description or suggestion in the OSHA regulations that these final action items and/or interim action items should be stored in the data processing system as part of a stored resolution plan. Accordingly, Claim 17 is independently patentable. Similar analysis applies to Claims 18-22.

Claims 1-74 Are Patentable Under 35 USC §103(a)

Claims 1-74 were rejected under 35 USC §103(a) as being unpatentable over Herrington in combination with U.S. Patent 5,950,217 to Heinlein et al., taken with OSHA 61:57646-56856, November 4, 1996. For purposes of appeal, Applicants hereby incorporate all of the analysis of these claims from Pages 22-29 of their Amendment of November 3, 2003. This analysis showed that Herrington does not describe or suggest the recitations of Claims 1-74 and that Heinlein et al. does not supplying the missing teachings. This analysis will not be repeated for the sake of brevity. Moreover, Claims 69-74 have been canceled. The following remarks will respond to the "Response to Arguments" at Pages 7-12 of the Official Action of January 29, 2004.

More specifically, at Paragraph 25 of the "Response to Arguments", Claims 23 and 24 were rejected as being obvious in view of Herrington and Heinlein et al. However, Claims 23 and 24 recite:

> 23. The method of Claim 1, further comprising the step of generating a resolution database after the step of generating the resolution plan.

> 24. The method of Claim 23, wherein the resolution database comprises one or more parameters selected from the group consisting of the names of persons responsible for carrying out the resolution plan, departments responsible for carrying out the resolution plan, sites at which the resolution plan will be carried out, target dates for completion of the resolution plan, completed action items, and uncompleted action items.

The Official Action cites Herrington, Page 112, col. 1, line 22-col. 2, line 6, as describing that the method of Herrington is performed in a data processing system such as a database. However, this passage states:

> The implementation team developed an implementation process flowchart (Figure 3), which was used to apply the MI Manual to each of the covered process areas within the division.
>
> Even before MI inspections had begun there was a need to list the items of equipment to be inspected and to associate with each item certain inspection parameters such as type of inspection, frequency, applicable procedures and standards, location, and a number of other types of data. Once the inspections began, the data to be managed began to expand geometrically. The effort to develop a comprehensive database to contain and manage all of the MI data is still ongoing. Currently several unconnected databases are being used, and this imposes a significant burden on the data manager to enter and update data. An equipment-related database team is now at work within the division to bring about the merger and improvement of a number of formerly independent databases, and this effort will continue for some time after the fully implemented MI program is in place.

This combining of independent databases for an MI program does not suggest the generation of a resolution database of Claim 23 or the parameters of Claim 24.

In Paragraph 26 of the "Response to Arguments", independent Claims 25 and 47 were rejected based on Herrington in combination with Heinlein et al. Claims 25 and 47 are system and computer program analogs of independent Claim 1, and are patentable for the same reasons that were described above. This analysis will not be described further herein. Moreover, the rejection cites Heinlein et al., Column 1, lines 61-66. However, this passage states:

> The Occupational Safety and Health Administration (OSHA) developed the process safety management (PSM) standard (1910.119). The objective of PSM is to prevent the undesired release of hazardous chemicals especially into locations which could expose employees and others to serious hazards.

This passage simply does not describe or suggest the recitations of Claims 25 or 47.

At Paragraph 27 of the "Response to Arguments", Claims 35, 36, 57 and 58 were rejected for the same reasons as Claims 10 and 11. Claims 35, 36, 57 and 58 are

patentable for the same reasons that were described above for Claims 10 and 11. This analysis will not be repeated for the sake of brevity.

At Paragraph 28 of the "Response to Arguments", Claim 9 was rejected based on Herrington, Page 111, col. 2, lines 1-27 and Table 3. However, this passage describes failure modes for piping systems and classifications based on the potential risks once the failure occurs. This does not describe or suggest the risk matrix that was recited in Claim 9.

New Claims 75-86 Are Patentable

New independent Claims 75, 79 and 83 are method, system and computer program product analogs of one another. These claims are patentable for the same reasons that were described in connection with Claim 1. Moreover, these claims also recite:

> customizing the selected study type on the data processing system by creating a risk matrix to evaluate the selected chemical process on the data processing system....

The customized selected study type is then performed. As was already described, none of the references describe or suggest taking a standardized study type and then customizing it for a particular chemical process, by creating a risk matrix for the selected chemical process. Accordingly, Claims 75, 79 and 83 are patentable at least for these additional reasons. Dependent Claims 77-78, 80-82 and 84-86 are patentable at least per the patentability of the independent claims from which they depend.

New Claims 87-101 Are Patentable

Independent Claims 87, 92 and 97 are method, system and computer program product analogs of one another. These claims contain all the recitations of Claim 1, and are therefore patentable for the reasons that were described above. Moreover, Claim 87 also recites:

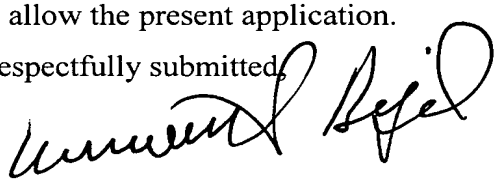
> ...wherein the resolution plan comprises a final action item, at least one interim action item to be completed prior to the completion of the final action item and at least one target date for completing an action item; and
>
> tracking the resolution plan in the data processing system, to monitor for completion of action items, wherein the status of the resolution plan is monitored for completion of action items by the target date.

Applicants respectfully submit that the combination of Herrington and Heinlein et al. and the OSHA regulations do not describe or suggest this combination of steps that are performed on a data processing system. Accordingly, Claims 82, 92 and 97 are independently patentable. Moreover, dependent Claims 88-91, 93-96 and 98-101 are patentable at least per the patentability of original Claims 21-24. This analysis will not be repeated for the sake of brevity.

Conclusion

Applicants again appreciate the thorough analysis that was provided in the lengthy and detailed Official Action. However, Applicants have now amended the independent claims and added new independent claims which clearly recite the patentable distinctions over the cited references. Moreover, Applicants have now succinctly explained the difference between MI and PHA, and how PHAs cannot be generalized from Herrington's disclosure of MI. In view of the above, Applicants respectfully the Examiner to take a fresh look at the pending claims, and to allow the present application.

Respectfully submitted,



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